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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/824,499	04/15/2004	Masaki Katagiri	1458.00046	6570

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BANNER & WITCOFF
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WASHINGTON, DC 20001

EXAMINER


HANNAHER, CONSTANTINE

ART UNIT	PAPER NUMBER
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2878

DATE MAILED: 08/13/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/824,499	Applicant(s) KATAGIRI, MASAKI	
	Examiner Constantine Hannaher	Art Unit 2878	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 April 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☒ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☒ Certified copies of the priority documents have been received in Application No. 09/940,449.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>20040415</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION**Oath/Declaration**

1. The oath or declaration is defective. A new oath or declaration in compliance with 37 CFR 1.67(a) identifying this application by application number and filing date is required. See MPEP §§ 602.01 and 602.02.

The oath or declaration is defective because:

It does not identify the mailing address of each inventor. A mailing address is an address at which an inventor customarily receives his or her mail and may be either a home or business address. The mailing address should include the ZIP Code designation. The mailing address may be provided in an application data sheet or a supplemental oath or declaration. See 37 CFR 1.63(c) and 37 CFR 1.76.

The postal code for the Tokai Research Establishment is conspicuously absent. Note that the name of a prefecture is NOT acceptable as the city of residence. If "Ibaraki" is not a municipality which may be fairly called a city, the papers are additionally defective for not identifying the city of residence of the inventor. The residence information may be provided on either on an application data sheet or supplemental oath or declaration.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 5, 6, 7, 8, 11, 17, 14, 18, 15, and 20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The use in dependent claims 5-7 of the indefinite article "a" and the inclusion of sheet descriptors not found in the parent claims (claim 2, for example, recites only a scintillator sheet) renders it unclear as to whether the particular sheet of the parent claim is

also grooved on its bottom surface or whether an entire additional sheet, chosen from the three options, is somehow included in the two-dimensional radiation image detector.

A claim which claims both an apparatus and method steps of using the apparatus is indefinite. *Ex parte Lyell*, 17 USPQ2d 1548 (Bd. Pat. App. & Inter. 1990). Claims 8 and 20 recite a two-dimensional radiation (or neutron) image detector and a method of preparation and use. The balance of the claims is rejected based on their dependence.

Claim 17 recites the limitation “the radiation detecting medium” in lines 3-4. There is insufficient antecedent basis for this limitation in the claim. Claims 8 and 11 establish no such radiation detecting medium. This same rejection applied to claims 14, 18, and 15.

Claim Rejections - 35 USC § 101

4. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

5. Claims 8, 11, 17, 14, and 20 are rejected under 35 U.S.C. 101 because claims 8 and 20 are directed to neither a “process” nor a “machine,” but rather embrace or overlap two different statutory classes of invention set forth in 35 U.S.C. 101 which is drafted so as to set forth the statutory classes of invention in the alternative only. *Ex parte Lyell*, 17 USPQ2d 1548, 1551 (Bd. Pat. App. & Inter. 1990). Claims 8 and 20 recite a two-dimensional radiation (or neutron) image detector and a method of preparation and use. The balance of the claims is rejected based on their dependence.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 9, 10, and 20 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Katagiri (JP2000187077A).

With respect to independent claim 9 and dependent claim 10, see Fig. 7.

With respect to independent claim 20, as best understood, see Fig. 3.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 1, 2, 5, 3, 6, 4, and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schreiner *et al.* (US006563121B1) in view of Sealock *et al.* (US005783829A) and DiFilippo (US006078052A).

With respect to independent claims 1 and 2 and dependent claim 5, Schreiner *et al.* discloses a two-dimensional radiation image detector (Fig. 2) comprising a scintillator sheet 18 in which the top surface has grooves 24 cut at predetermined spacings in a horizontal and a vertical direction to a depth at least one half the thickness of the scintillator sheet (because 10 mm is at least one half of 1.9 cm, see column 3, lines 8 and 15) and a fluorescence reflector buried in the grooves 24 (column 5, line 10) to form a group of pixels 26. However, Sealock *et al.* teaches that optical fibers placed in grooves cut into the top surface of a scintillator sheet (Fig. 9) offers excellent position resolution at a high rate. Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the detector of Schreiner *et al.* to replace some of the buried reflector with

buried optical fibers as suggested by Sealock *et al.* Additional optical fiber bundles arranged on top or bottom or both surfaces of the scintillator sheet are suggested by DiFilippo in view of the additional capture of scintillations thereby, so it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the detector suggested by Schreiner *et al.* and Sealock *et al.* to comprise further optical fiber bundles on such surfaces. The placement and arrangement of the optical fiber bundles are choices within the ordinary skill in the art in view of the desired performance.

With respect to independent claims 3 and 4 and dependent claims 6 and 7, although the references in general teach a scintillator sheet, they are not so limited and freely suggest alternatives (see Schreiner *et al.* at column 4, lines 34-47 or DiFilippo at column 7, lines 20-35). The use of a “fluorescence collecting sheet” with “radiation detecting mediums” is nothing more than scintillators and an optical light guide which the art recognizes as equivalent to a scintillation crystal but is useful, for example, in reducing the thickness of the scintillator and thus the sensitivity to higher energies. Likewise, a “wavelength shifter sheet” with “radiation detecting mediums” is nothing more than scintillators and an optical light guide with the property of the fibers in Sealock *et al.* and DiFilippo which the art recognizes as equivalent to a scintillation crystal but which affords greater efficiency in capturing information of radiation incidence. Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the detector suggested by Schreiner *et al.*, Sealock *et al.*, and DiFilippo to comprises a fluorescence collecting sheet or wavelength shifter sheet with radiation detecting mediums.

10. Claims 8 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Madono *et al.* (US006066851A) in view of Katagiri (JP2000187077A).

With respect to independent claim 8, Madono *et al.* discloses a two-dimensional radiation image detector (Fig. 7) comprising a liquid scintillator **230** and a white plastic block **231** which acts as a reflector block (column 7, lines 64-66). The block **231** is divided into a grid pattern of cells. Although the block **231** in the detector of Madono *et al.* is not placed in a detection vessel capable of sealing off the liquid scintillator **230**, the enclosure of liquid scintillator within a vessel is known from Katagiri and in view of the need to enclose the liquid scintillator (as acknowledged by Madono *et al.* in providing cap **232** or individual alternatives) it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the detector of Madono *et al.* to place block **231** in a detection vessel filled with liquid scintillator. The placement of optical fiber bundles is also shown in Katagiri, and it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the detector of Madono *et al.* to comprise such optical fiber bundles in view of the utility in directing light from the scintillator **230** to a detector.

With respect to dependent claim 14, to the extent understood, Katagiri identifies the recited elements several times (paragraph [0009], for example) and their utility for neutron conversion is too well known to require citation. In view of the increased utility of a radiation image detector that could detect neutrons, it would have been obvious to one of ordinary skill in the art to modify the liquid scintillator suggested by Madono *et al.* and Katagiri to include a neutron converter element therein.

11. Claims 11 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Madono *et al.* (US006066851A) and Katagiri (JP2000187077A) as applied to claim 8 above, and further in view of Koshishiba (JP 3-29256 A).

With respect to dependent claim 11, neither Madono *et al.* nor Katagiri appear to describe any circulating mechanism for the liquid scintillator, but Koshishiba teaches that a liquid scintillator which is kept new by a circulating mechanism improves response speed, service life, and gain. In view of these advantages as taught by Koshishiba, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the detection vessel suggested by Madono *et al.* and Katagiri to be equipped with a liquid scintillator circulating mechanism comprising at least a pump **5** and piping **3** and valves as would have been necessary to prevent backflow to the tank **1** or premature leakage to pump **5**.

With respect to dependent claim 17, to the extent understood, Katagiri identifies the recited elements several times (paragraph [0009], for example) and their utility for neutron conversion is too well known to require citation. In view of the increased utility of a radiation image detector that could detect neutrons, it would have been obvious to one of ordinary skill in the art to modify the liquid scintillator suggested by Madono *et al.* and Katagiri to include a neutron converter element therein.

12. Claims 13, 19, 16, 12, 18, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Katagiri (JP2000187077A) and further in view of Koshishiba (JP 3-29256 A).

With respect to dependent claim 13, Katagiri does not appear to describe any circulating mechanism for the liquid scintillator, but Koshishiba teaches that a liquid scintillator which is kept new by a circulating mechanism improves response speed, service life, and gain. In view of these advantages as taught by Koshishiba, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the

detection vessel disclosed by Katagiri to be equipped with a liquid scintillator circulating mechanism comprising at least a pump **5** and piping **3** and valves as would have been necessary to prevent backflow to the tank **1** or premature leakage to pump **5**.

With respect to dependent claims 19 and 16, Katagiri identifies the recited elements several times (paragraph [0009], for example) and their utility for neutron conversion is too well known to require citation. In view of the increased utility of a radiation image detector that could detect neutrons, it would have been obvious to one of ordinary skill in the art to modify the liquid scintillator disclosed by Katagiri to include a neutron converter element therein.

With respect to dependent claim 12, Katagiri does not appear to describe any circulating mechanism for the liquid scintillator, but Koshishiba teaches that a liquid scintillator which is kept new by a circulating mechanism improves response speed, service life, and gain. In view of these advantages as taught by Koshishiba, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the detection vessel disclosed by Katagiri to be equipped with a liquid scintillator circulating mechanism comprising at least a pump **5** and piping **3** and valves as would have been necessary to prevent backflow to the tank **1** or premature leakage to pump **5**.

With respect to dependent claims 18 and 15, as best understood, Katagiri identifies the recited elements several times (paragraph [0009], for example) and their utility for neutron conversion is too well known to require citation. In view of the increased utility of a radiation image detector that could detect neutrons, it would have been obvious to one of ordinary skill in the art to modify the liquid scintillator disclosed by Katagiri to include a neutron converter element therein.

Response to Submission(s)

13. The amendment filed April 15, 2004 has been entered.

Conclusion

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Constantine Hannaher whose telephone number is (571) 272-2437. The examiner can normally be reached on Monday-Friday with flexible hours.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David P. Porta can be reached on (571) 272-2444. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Constantine Hannaher
Primary Examiner

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